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Vasudevan 3-2

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Vasudevan, Subramanian
Serial No.:	10/001,296
Filed:	11/02/2001
Group Art Unit:	2616
Examiner:	Wong, Warner
Title:	A METHOD FOR ALLOCATING WIRELESS COMMUNICATION RESOURCES

APPEAL BRIEF

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P. O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

Appellant now submits its brief in this appeal. The Commissioner is authorized to charge Deposit Account No. 50-1482 in the name of Carlson, Gaskey & Olds in the amount of $510.00, as well as for any additional fees or credit the account for any overpayment.

Real Party in Interest

Lucent Technologies, Inc. is the assignee of this application.

Related Appeals and Interferences

There are no related appeals or interferences.

Status of the Claims

Claims 1-19 are pending in the application.

Claims 1-19 stand rejected under 35 U.S.C. §103 as being unpatentable over U.S. Patent No. 6,018,528 (the *Gitlin* reference) in view of U.S. Patent No. 6,252,854 (the *Hortensius* reference).

Status of Amendments

There are no unentered amendments.

Summary of Claimed Subject Matter

There are three independent claims currently on appeal. Claim 1 recites a method of communicating over an air interface comprising transmitting information over a shared wireless channel by varying a time span and at least one of a bandwidth and a duty cycle, wherein the time span is based on a rate of change in channel quality. (Page 5, lines 17-18; page 8, lines 28-30 – page 9, lines 1-4)

As explained, for example, from page 5, lines 27 – page 6, line 18, varying the time span based on a rate of change in channel quality accounts for uncertainty with respect to channel quality at a time of actual transmission. Base station schedulers determine an appropriate time for transmission of data, voice or the like to a wireless unit based upon feedback pertaining to channel quality. However, a delay exists from the time the wireless unit measures its channel quality to the time the base station makes a data transmission to the wireless unit based on that channel quality measurement. The channel quality at the time of data transmission may be different from the reported channel quality because of that time lag. The magnitude of the difference depends on the rate at which the wireless link between the base station and the mobile station changes. If the channel quality at the time of actual transmission is poorer than the channel quality report used by the scheduler, the transmission format may not be adequate to insure successful reception by the wireless unit. By varying the time span and at least one of a bandwidth and a duty cycle for

transmitting information based upon a rate of change in channel quality, the claimed invention accounts for any uncertainty with respect to channel quality at the actual time of transmission.

Independent claim 10 recites a method of communicating over an air interface comprising receiving information over a shared wireless channel by varying a time span and at least one of a bandwidth and a duty cycle, wherein the time span is based on a rate of change in channel quality. (Page 5, lines 17-18; page 8, lines 28-30 – page 9, lines 1-4)

Claim 19 recites a method of allocating the resources for a wireless base station comprising allocating a shared wireless channel between at least two mobile communication devices by varying a time span and at least one of a bandwidth and a duty cycle for each downlink transmission in response to a channel quality of a wireless receiver, wherein the time span is based on a rate of change in channel quality. (Page 7, lines 24-27; page 5, lines 17-18; page 8, lines 28-30 – page 9, lines 1-4)

Grounds of Rejection to be Reviewed on Appeal

Claims 1-19 stand rejected under 35 U.S.C. §103 as being unpatentable over U.S. Patent No. 6,018,528 (the *Gitlin* reference) in view of U.S. Patent No. 6,252,854 (the *Hortensius* reference).

ARGUMENT

There is no *prima facie* case of obviousness. The proposed combination cannot be made because it would change the principle of operation of the *Gitlin* reference. Additionally, the proposed combination does not provide any benefit or usefulness in the context of the *Gitlin* reference and, therefore, the legally required reason to make the combination is absent. Further, the *Gitlin* reference relied upon by the Examiner does not teach what the Examiner contends.

If any one of those separately dispositive flaws in the Examiner's rejection were present, there is no *prima facie* case of obviousness. Given that all of them exist, there is no alternative but to reverse the rejection.

The rejection under 35 U.S.C. §103 of claims 1-19 based upon the proposed combination of the *Gitlin* and *Hortensius* references must be reversed.

The proposed combination cannot be made. The Examiner correctly acknowledges that the *Gitlin* reference fails to use a rate of change of channel quality for "his adjustments in wireless communication." The Examiner then proposes to extract a "rate of change in channel quality" from the *Hortensius* reference "in place of using the 'change quality' in preventing interference from exceeding the acceptable threshold in the wireless transmission method of *Gitlin*." (Final Office Action, page 3)

Such a modification cannot be made because it would change the principle of operation of the *Gitlin* reference. The *Gitlin* reference is concerned with avoiding interference between assigned codes in a CDMA system where those codes might interfere with each other. (col. 6. line 66 through col. 7, line 11) The *Gitlin* reference is focused on a technique of assigning CDMA codes to high bit-rate users and lower bit-rate users and scheduling them so that the bit error rate (BER) "caused by the total level of interference from all the transmissions remains below the acceptable threshold." (Column 8, lines 44-45) The *Gitlin* reference assigns the codes to the users and schedules the users based on their codes so that ***interference between codes*** will be kept at a low enough level to satisfy the acceptable threshold.

The *Gitlin* reference schedules users based on their codes in an attempt to manage the BER, which the Examiner equates with "channel quality." If one were to change how *Gitlin* approaches scheduling to look at a rate of change in channel quality from the *Hortensius*

reference (or any other reference for that matter) and use that in place of *Gitlin's* approach for avoiding interference between codes, that would completely change the principle of operation of the *Gitlin* reference. Such a modification cannot be made when attempting to manufacture a *prima facie* case of obviousness. (See, e.g., MPEP 2143.01(VI))

The Examiner states that one should use a rate of change in channel quality "in place of using" *Gitlin's* BER-based technique. That cannot be done without completely changing the principle of operation of the primary reference. Therefore, the proposed combination cannot be made and the rejection must be reversed.

The Examiner cannot reasonably contend that *Gitlin's* code-based scheduling technique could be combined with a rate of change in channel quality technique in a manner that would not involve changing the principle of operation of the *Gitlin* reference because that would not provide a workable result. For example, the Examiner contends that BER is the same as "channel quality." The BER results from the schedule set in *Gitlin*. Any rate of change in BER would, therefore, be entirely dependent on a rate of scheduling. The *Gitlin* schedule sets the BER within an acceptable level. Trying to vary a time span of one of the scheduled transmissions after a satisfactory schedule is already determined (based on a rate of change in BER or anything else for that matter) makes no sense whatsoever. In other words, the Examiner's proposed modification does not provide a workable or useful result. Rather, the very suggestion is unreasonable at best. Besides that, it would change the principle of operation.

Another reason why the proposed combination cannot be made is because it does not provide any benefit or usefulness in the context of the *Gitlin* reference. Where a proposed combination does not provide any benefit in the context of the primary reference, the legally

required reason for making the combination does not exist and there is no *prima facie* case of obviousness.

The *Hortensius* reference describes a ***repetition rate selection***, which is a rate at which a transmitting station repeats its symbols and that has nothing to do with scheduling users based on an assigned CDMA code. For example, column 3, lines 28-32 indicate that the repetition rate RR is for encoding data at a sending station. The Examiner relies upon the mention of using link quality in the abstract of the *Hortensius* reference, for example. The only use of the link quality information in that reference is for calculating the repetition rate.

The repetition rate of the *Hortensius* reference is not the same thing as and has nothing to do with the scheduling used in the *Gitlin* reference, which as mentioned above is focused on scheduling users based upon whether they are a high bit-rate or low bit-rate user and so that their assigned codes do not interfere. It follows that there would be no benefit or usefulness for the *Hortensius* repetition rate calculation technique in the context of the code-based scheduling technique of the *Gitlin* reference.

In other words, the *Hortensius* reference mentions a speed of change in the link quality as something that is considered for calculating a repetition rate that is used for repeating symbols when encoding data at a sending station. How that fits in with a code-based scheduling technique that is targeted at avoiding interference that might otherwise be caused by interfering codes is a mystery that the Examiner cannot explain. The Examiner has not provided (and cannot hypothetically provide) any reason to explain why one skilled in the art would take one feature of a repetition rate calculation technique and somehow incorporate that into a scheduling technique that is based purely upon avoiding interference between codes assigned to different

users. *Hortensius*' repetition rate calculating technique does not have any usefulness nor does it provide any benefit in the context of the code-based scheduling of the *Gitlin* reference.

Therefore, the proposed combination cannot be made because it does not provide any benefit. At best, the *Hortensius* reference repetition rate would be added onto the *Gitlin* code-based scheduling technique without any logical interaction between them. The *Hortensius* repetition rate does not in any way enhance the *Gitlin* code-based scheduling technique. There simply would be no reason for a person of skill in the art to consider the repetition rate calculation technique of *Hortensius* in the context of the code-based scheduling technique of the *Gitlin* reference. There is certainly no reason to consider determining a rate of change in BER or using that to vary a time span of a scheduled transmission based on what the *Hortensius* reference teaches. When, as here, a proposed combination provides no benefit or usefulness, the legally required reason for making the proposed combination is absent and there is no *prima facie* case of obviousness.

Additionally, even if there could somehow be some justification for finding some usefulness or benefit to add a repetition rate calculation technique to Gitlin's code-based scheduling technique, the addition of a rate of change in BER to Gitlin makes no sense and changes the principle of operation as already explained. The BER in Gitlin depends on how the different codes are scheduled. Any rate of change in BER, therefore, depends on a rate of scheduling. Using that would not make any sense as an acceptable schedule was already determined and the BER was set. Moreover, varying a time span based on a rate of change in BER would change the principle of operation of the Gitlin reference, which cannot be done.

At best, the Examiner's proposed combination, which cannot be made, appears to be based on hindsight reasoning relying upon Applicant's claims to piece together unrelated portions

of the references as stated in the Office Action. Hindsight reasoning is not a proper basis for attempting to manufacture a *prima facie* case of obviousness. There is no other possible explanation for how to extract a few words from the *Hortensius* reference in an attempt to modify the *Gitlin* reference (in a manner that is not permissible) other than hindsight reasoning.

One other reason why there is no *prima facie* case of obviousness is because the Examiner incorrectly contends that the *Gitlin* reference teaches "transmitting/receiving information over a shared wireless channel by varying a time span (total time slots to transfer entire information payload) and at least one of a bandwidth (frequency bands or code space) and a duty cycle (# of time slots for a user), wherein the time span is based on the channel quality." (Final Office Action, page 2) The *Gitlin* reference does not use channel quality for varying a total of time slots to transfer entire information payload as suggested by the Examiner. Instead, the *Gitlin* reference schedules the users so that there is no ***interference between the codes*** to keep the bit error rate (BER) at an acceptable threshold. The *Gitlin* reference is focused on a technique of assigning CDMA codes to high bit-rate users and lower bit-rate users and then to schedule them so that the bit error rate (BER) "caused by the total level of interference from all the transmissions remains below the acceptable threshold." (Column 8, lines 44-45) The *Gitlin* reference assigns the codes to the users and schedules the users based on their codes so that ***interference between codes*** will be kept at a low enough level to satisfy the acceptable threshold. The use of different codes and strategically scheduling users of such codes in *Gitlin* does not correspond to varying "time span" according to the BER as suggested by the Examiner. Instead, the scheduling of the codes relative to each other determines the BER. There is nothing in the Gitlin reference that in any way discloses or suggests varying a time span (the Examiner's "total of time slots to transfer entire information payload") based on the BER. The only reasonable

interpretation of Gitlin's technique is that the codes are scheduled within the acceptable BER threshold and then the scheduled transmission presumably occurs.

The Examiner's explanation for the proposed interpretation of the *Gitlin* reference is as follows, "The Examiner clearly understands from the *Gitlin's* citation (above) in combination with *Gitlin's* drawings that time, frequency and/or code scheduling is based on BER, which IS the channel quality." (Emphasis in original, Final Office Action, page 6) Part of the problem with the Examiner's analysis is that nothing in *Gitlin* even remotely suggests varying a time span (regardless of how the Examiner interprets "time span") based on the BER.

Given that the *Gitlin* reference does not teach what the Examiner contends, even if the proposed combination of the *Gitlin* and *Hortensius* references could be made, there is no *prima facie* case of obviousness because the result is not what the Examiner contends.

CONCLUSION

There is no *prima facie* case of obviousness against any of Applicant's claims. There are several, separately dispositive reasons why the proposed combination cannot even be made. Even if it could, the *Gitlin* reference does not teach what the Examiner contends and the result does not establish a *prima facie* case of obviousness. Any one of the independently dispositive reasons why there is no *prima facie* case of obviousness explained above requires that the rejection under 35 U.S.C. §103 of claims 1-19 be reversed.

Respectfully submitted,

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Date

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APPENDIX OF CLAIMS

1. A method of communicating over an air interface comprising:

transmitting information over a shared wireless channel by varying a time span and at least one of a bandwidth and a duty cycle, wherein the time span is based on a rate of change in channel quality.

2. The method of Claim 1, wherein the at least one of a bandwidth and a duty cycle are varied as a function of a channel quality of a wireless receiver.

3. The method of Claim 2, wherein the channel quality comprises at least one of a signal to noise ratio, a bit error rate, a frame error rate and a power loss of a wireless link between the wireless receiver and a wireless transmitter.

4. The method of Claim 2, wherein the channel quality comprises at least one of interference from information transmitted to at least one other wireless receiver, background noise and thermal noise.

5. The method of Claim 1, further comprising the step of transmitting a signal corresponding with a transmission format having a time span and at least one of a bandwidth and a duty cycle to be employed for the information to be transmitted.

6. The method of Claim 5, wherein the signal comprises a bit sequence corresponding with at least one of the varied time span, the varied bandwidth and the varied duty cycle.

7. The method of Claim 6, wherein the transmitting a signal comprises:

determining the transmission format; and

recalculating the bandwidth of the transmission format if the time span is greater than an information payload to be transmitted divided by a data rate of the wireless receiver.

8. The method of Claim 3, wherein the transmitting a signal comprises:

determining the transmission format; and

recalculating the duty cycle of the transmission format if the time span is greater than an information payload to be transmitted divided by a data rate of the wireless receiver.

9. The method of Claim 8, wherein the duty cycle is determined by dividing the information payload by the product of the data rate and the time span.

10. A method of communicating over an air interface comprising:

receiving information over a shared wireless channel by varying a time span and at least one of a bandwidth and a duty cycle, wherein the time span is based on a rate of change in channel quality.

11. The method of Claim 10, wherein the at least one of a bandwidth and a duty cycle are varied as a function of a channel quality of a wireless receiver.

12. The method of Claim 11, wherein the channel quality comprises at least one of a signal to noise ratio, a bit error rate, a frame error rate and a power loss of a wireless link between the wireless receiver and a wireless transmitter.

13. The method of Claim 11, wherein the channel quality comprises at least one of interference from information transmitted to at least one other wireless receiver, background noise and thermal noise.

14. The method of Claim 10, further comprising the step of receiving a signal corresponding with a transmission format having a time space and at least of a bandwidth and a duty cycle to be employed for the information to be transmitted.

15. The method of Claim 14, wherein the signal comprises a bit sequence corresponding with at least one of the varied time span, varied bandwidth and the varied duty cycle.

16. The method of Claim 15, wherein the receiving a signal comprises:

determining the transmission format; and

recalculating the bandwidth of the transmission format if the time span is greater than an information payload to be transmitted divided by a data rate of the wireless receiver.

17. The method of Claim 15, wherein the receiving a signal comprises:

determining the transmission format; and

recalculating the duty cycle of the transmission format using a duty cycle if the time span is greater than an information payload to be transmitted divided by a data rate of the wireless receiver.

18. The method of Claim 17, wherein the duty cycle is determined by dividing the information payload by the product of the data rate and the time span.

19. A method for allocating the resources of a wireless base station comprising:

allocating a shared wireless channel between at least two mobile communication devices by varying a time span and at least one of a bandwidth and a duty cycle for each downlink transmission in response to a channel quality of a wireless receiver, wherein the time span is based on a rate of change in channel quality.

EVIDENCE APPENDIX

None.

RELATED PROCEEDINGS APPENDIX

None.

CERTIFICATE OF FACSIMILE

I hereby certify that this Appeal Brief, relative to Application Serial No. 10/001/296 is being facsimile transmitted to the Patent and Trademark Office (Fax No. (571) 273-8300) on April 24, 2008.

David Gaskey